AMENDMENTS TO THE CLAIMS

The following claim listing replaces all prior listings of the claims submitted in the application:

Claims 1 - 37. (Cancelled)

38. (Currently Amended) A fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising, in combination:

a fluid-handling manifold having a fluid inlet port and defining a fluid-handling void comprising at least a first fluid channel; [[and]]

a second fluid channel in fluid communication with the first fluid channel at an intersection within the ultrasonic cavity; and

an ultrasonic particle manipulator defining an ultrasonic cavity and comprising at least one ultrasonic transducer, the first fluid channel extending from the inlet port to the ultrasonic cavity and the ultrasonic particle manipulator being operative to establish an ultrasonic standing wave field in particle-bearing fluid in the first fluid channel at the ultrasonic cavity, [[and]]

wherein the ultrasonic cavity has a non-uniform configuration;

wherein the first fluid channel and the second fluid channel extend substantially parallel each other on opposite sides of a dividing wall between them, and

wherein the intersection comprises a passageway through the dividing wall.

39. (Previously Presented) The fluid-handling device of claim 91 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic cavity has a non-uniform configuration.

Claims 40 - 42. (Cancelled)

43. (Previously Presented) The fluid-handling device of claim 38 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic cavity has a configuration that is non-uniform in the direction of flow.

Claims 44-55. (Cancelled)

56. (Previously Presented) The fluid-handling device of claim 38 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic cavity has a cross-sectional configuration that is non-uniform in a direction substantially transverse to the direction of flow in the first fluid channel.

57. (Currently Amended) ~~The fluid-handling device of claim 38 for ultrasonic manipulation of fluid-borne particles, wherein:~~ A fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising, in combination:

a fluid-handling manifold having a fluid inlet port and defining a fluid-handling void comprising at least a first fluid channel; and

an ultrasonic particle manipulator defining an ultrasonic cavity and comprising at least one ultrasonic transducer, the first fluid channel extending from the inlet port to the ultrasonic cavity and the ultrasonic particle manipulator being operative to establish an ultrasonic standing wave field in particle-bearing fluid in the first fluid channel at the ultrasonic cavity,

wherein the fluid-handling void further comprises a second fluid channel in fluid communication with the first fluid channel at an intersection within the ultrasonic cavity;

the ultrasonic particle manipulator is operative to establish an ultrasonic standing wave field having an axial direction of standing wave propagation substantially perpendicular to the direction of fluid communication through the intersection;

the cross-sectional configuration of the ultrasonic cavity is non-uniform in the direction of fluid communication through the intersection; and

the ultrasonic particle manipulator is operative to collect fluid-borne particles from fluid in the first fluid channel and move collected fluid-borne particles through the intersection to the second fluid channel by varying the actuation frequency of the ultrasonic transducer.

58. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to selectively position an ultrasonic standing wave field in the second fluid channel.

59. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to selectively position an ultrasonic standing wave field in the intersection of the first and second fluid channels.

60. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases stepwise along the direction of fluid communication through the intersection.

61. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases continuously along the direction of fluid communication through the intersection.

62. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation varies wave-like along the direction of fluid communication through the intersection.

63. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic transducer

and has a stepwise configuration along the direction of fluid communication through the intersection.

64. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic transducer and has a sloping configuration along the direction of fluid communication through the intersection.

65. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic transducer and has a wave-like configuration along the direction of fluid communication through the intersection.

66. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by an ultrasonic reflector and has a stepwise configuration along the direction of fluid communication through the intersection.

67. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by an ultrasonic reflector and has a sloping configuration along the direction of fluid communication through the intersection.

68. (Original) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein a surface of the ultrasonic cavity is formed by the ultrasonic reflector and has a wave-like configuration along the direction of fluid communication through the intersection.

69. (Cancelled)

70. (Currently Amended) The fluid-handling device of claim 38 ~~claim 69~~ for ultrasonic manipulation of fluid-borne particles, wherein the dividing wall between the first and second fluid channels is 10 microns to 30 microns thick.

71. (Previously Presented) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the first fluid channel and the second fluid channel intersect each other substantially tangentially.

72. (Previously Presented) The fluid-handling device of claim 57 for ultrasonic manipulation of fluid-borne particles, wherein the intersection between the first fluid channel and the second fluid channel comprises an orifice.

Claims 73 - 84. (Cancelled)

85. (Currently Amended) A fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising, in combination:

a fluid-handling manifold having a fluid inlet port;

a first fluid channel in fluid communication with the fluid inlet port; [[and]]

an ultrasonic particle manipulator comprising at least one ultrasonic transducer and an acoustic reflector positioned opposite the ultrasonic transducer, the ultrasonic transducer and the acoustic reflector cooperatively defining between them an ultrasonic cavity and operative to separate fluid-borne particles from fluid flowed through the ultrasonic cavity by establishing an ultrasonic standing wave field in a portion of the first fluid channel extending through the ultrasonic cavity; and

a second fluid channel in fluid communication with the first fluid channel at an intersection within the ultrasonic cavity,[[;]]

wherein the first fluid channel and the second fluid channel extend substantially parallel each other on opposite sides of a dividing wall between them, and

wherein the intersection comprises a passageway through the dividing wall.

86. (Cancelled)

87. (Previously Presented) The fluid-handling device of claim 85 for ultrasonic manipulation of fluid-borne particles, wherein the spacing between the ultrasonic transducer and the acoustic reflector is not more than 300 microns.

88. (Previously Presented) The fluid-handling device of claim 85 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to establish an ultrasonic standing wave field having an axial direction of standing wave propagation substantially perpendicular to the direction of fluid communication through the intersection.

89. (Previously Presented) The fluid-handling device of claim 85 for ultrasonic manipulation of fluid-borne particles, wherein the cross-sectional configuration of the ultrasonic cavity is non-uniform in the direction of fluid communication through the intersection.

90. (Previously Presented) The fluid-handling device of claim 85 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to collect fluid-borne particles from fluid in the first fluid channel and move collected fluid-borne particles through the intersection to the second fluid channel by varying the actuation frequency of the ultrasonic transducer.

91. (Currently Amended) A fluid-handling device for ultrasonic manipulation of fluid-borne particles, comprising:

an ultrasonic particle manipulator defining an ultrasonic cavity and comprising at least one ultrasonic transducer and an acoustic reflector;

a first fluid channel extending into the ultrasonic cavity; and

a second fluid channel in fluid communication with the first fluid channel at an intersection within the ultrasonic cavity,

wherein the first fluid channel and the second fluid channel extend substantially parallel each other on opposite sides of a dividing wall between them, and the intersection comprises a passageway through the dividing wall, [[and]]

wherein the ultrasonic particle manipulator is operative to establish an ultrasonic standing wave field in fluid in the ultrasonic cavity, and

wherein the spacing between the ultrasonic transducer and the acoustic reflector is not more than 300 microns.

92. (Previously Presented) The fluid-handling device of claim 91 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to establish an ultrasonic standing wave field having an axial direction of standing wave propagation substantially perpendicular to the direction of fluid communication through the intersection.

93. (Previously Presented) The fluid-handling device of claim 91 for ultrasonic manipulation of fluid-borne particles, wherein the cross-sectional configuration of the ultrasonic cavity is non-uniform in the direction of fluid communication through the intersection.

94. (Previously Presented) The fluid-handling device of claim 91 for ultrasonic manipulation of fluid-borne particles, wherein the ultrasonic particle manipulator is operative to

collect fluid-borne particles from fluid in the first fluid channel and move collected fluid-borne particles through the intersection to the second fluid channel by varying the actuation frequency of the ultrasonic transducer.

95. (Previously Presented) The fluid-handling device of claim 91 for ultrasonic manipulation of fluid-borne particles, wherein the dimension of the ultrasonic cavity in the axial direction of standing wave propagation increases stepwise along the direction of fluid communication through the intersection.

96. (Cancelled)

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